

عنوان مقاله:

Forced Convective Heat Transfer of Laminar Flow by Nano fluid in a Equilateral Triangular Duct with One Constant Temperature Side and Two Constant Heat Flux Sides

محل انتشار:

سومین همایش ملی فناوری نانو از تئوری تا کاربرد (سال: 1393)

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خلاصه مقاله:

This Article is a Numerical solution method. Distilled water and CuO-water Nano-fluid with volume fraction of 1%, 2% and 4% was used. Flow regime is laminar with Reynolds Number of 100 and steady state. Nanoparticle size are $d=20\text{nm}$ and $d=80\text{nm}$. The cross section of channel is equilateral triangular with hydraulic diameter of 8 millimeter and the length of channel is 1000 millimeter. The problem is solved for two states, the first one is constant heat flux for all three sides and the second one is constant heat flux for two sides and constant temperature for the other side (Hot plate). Convection heat transfer coefficient, Nusselt number, pressure loss through the channel, velocity distribution in cross section and temperature distribution on walls are investigated in this article for all states. The fluid flow is supposed to one phase flow. It was seen that using Nano-fluid leads to a good increasing on heat transfer coefficient and also increases pressure loss through the channel and velocity distribution in fully developed cross section of channel. Decreasing nanoparticle size doesn't lead to a much better heat transfer properties. The results show a good agreement between numerical and experimental solutions

کلمات کلیدی:

Convective heat transfer coefficient, Nano-fluid, Nusselt Number, Laminar flow

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